

USGS Activities in the Lake Tahoe Basin

Lake Tahoe is famous for its alpine setting and deep, clear water. Over the last half century, clarity has declined by 30–40 feet or 1 foot per year. This decline in clarity has been attributed, in part, to nutrients and sediments delivered to the lake by its tributary streams and nutrients from ground-water inflow.

For decades, the U.S. Geological Survey (USGS) has been involved with a wide range of scientific research and monitoring activities in the Lake Tahoe Basin. Water-related activities include stream quantity and quality, ground-water levels and quality, and lake levels and quality. Mapping activities include topographic, bathymetric, and geologic; land-cover and land-use change delineation; and socioeconomic modeling.

The USGS Water Science Centers in Nevada (NWSC) and California (CWSC), Geology and Geography Disciplines, in cooperation with Federal, State and local agencies, are involved with the following:

Current Activities

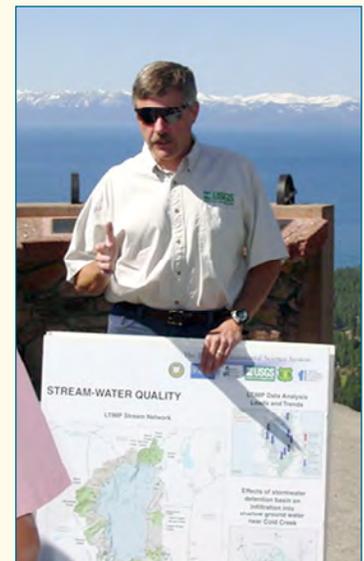
Tahoe Decision Support System: The Tahoe Decision Support System (TDSS) tool is being developed to assist the Tahoe Regional Planning Agency (TRPA) with estimating the effects of policy decisions on local economic and environmental health.
http://www.nwra.org/docs/journal/jnwra_2_article2_halsing.pdf

Land-Cover Characterization: A land-cover characterization study is being completed as part of a Nationwide study. The land-cover dataset includes information from LandSat satellites as well as many other sources such as census statistics.
<http://geography.wr.usgs.gov/science/tahoe.html>

Stream Monitoring: Nutrient, suspended-sediment, water-quality, and streamflow data are currently collected at 20 sites, in cooperation with TRPA and the University of California, Davis, and as part of the Lake Tahoe Interagency Monitoring Program (LTIMP). Runoff from the Gondola Fire area also is being monitored. These data are used to provide a consistent, long-term database and to identify trends throughout the Basin. Data are stored in the National Water Information System (NWIS) <<http://waterdata.usgs.gov/nv/nwis>> and are compiled annually.
<http://nevada.usgs.gov/ADR/index.htm>

Ground-Water Monitoring: Shallow ground-water in South Lake Tahoe is being studied to determine potential transport of contaminants. A ground-water study in the Bijou Creek area of South Lake Tahoe was recently completed as was a ground-water/surface-water interaction study in the Trout Creek area. Data from these studies are stored in NWIS <<http://waterdata.usgs.gov/nv/nwis>> and are compiled annually <<http://nevada.usgs.gov/ADR/index.htm>>.

Cattlemans Detention Basin Effectiveness: The effects on ground-water quality and levels from the construction and operation of a stormwater detention basin along Cold Creek are being examined in partnership with El Dorado County, Calif. This project includes examining geochemical processes affecting water quality and using a numerical ground-water flow model to analyze ground-water/surface-water interactions. <http://pubs.water.usgs.gov/sir2004-5254>



Tim Rowe, USGS Hydrologist, presents results from a USGS study at Lake Tahoe. Photograph by M.L. Strobel, May 2004.



View of Lake Tahoe looking west-northwest from Gondola Fire burned area; South Lake Tahoe, Calif., and Staterline, Nev., in foreground. Photograph by K.K. Allander, October 2002.

Stream Monitoring: Streamflow and lake levels have been collected at various sites since 1900. Water-quality has been monitored at various times and sites since the 1970's. <http://waterdata.usgs.gov/nwis>

Monitoring of Lake Tahoe Basin Lakes: Nutrient and water-quality data were collected at five lakes and their outlet streams from 2002 to 2004. <http://pubs.water.usgs.gov/of2004-1333>

Organics Survey: Determined the presence of manmade organic compounds in selected tributaries, near their outlets, and at several Lake locations. Semipermeable membrane devices were installed at selected sites in 1998 and again in 2002–04. <http://pubs.water.usgs.gov/wrir994218>

LTIMP Data Analysis: Nutrient and suspended-sediment loads, yields, and trends were calculated from 1988 to 1998 for 20 LTIMP sites. <http://pubs.water.usgs.gov/wri02-4030>

Floodflow: Flood frequencies were studied at 46 stream sites in 1998 and 2002. <http://pubs.water.usgs.gov/fs03-502>

Precipitation-Runoff Simulations: Precipitation and associated runoff simulations were modeled for 15 subbasins as part of the Truckee-Carson Program.

Sediment Source and Channel Erosion: Sources, volume, characteristics, and production rates of sediment and transport of eroded material were studied in four basins from 1984 to 1987. <http://pubs.er.usgs.gov/pubs/wri/wri914054>

Suspended Sediment and Nutrient Transport: Nutrient and sediment data were collected and analyzed from streams in the Edgewood and Glenbrook Creek and Incline Village areas, as well as along several highway locations in California, during the 1970's and 1980's. <http://pubs.er.usgs.gov/pubs/wsp/wsp2313>

Nutrient and Trace-Metal Chemistry: Nutrients and trace metals were researched in the late 1980's and early 1990's as part of the USGS National Research Program.

Mapping/Digital-Data Products

Urban Dynamics: Remote-sensing techniques were used to analyze land-use change in the South Lake Tahoe area to provide a historical perspective of the change. <http://pubs.usgs.gov/of/of01-418/>

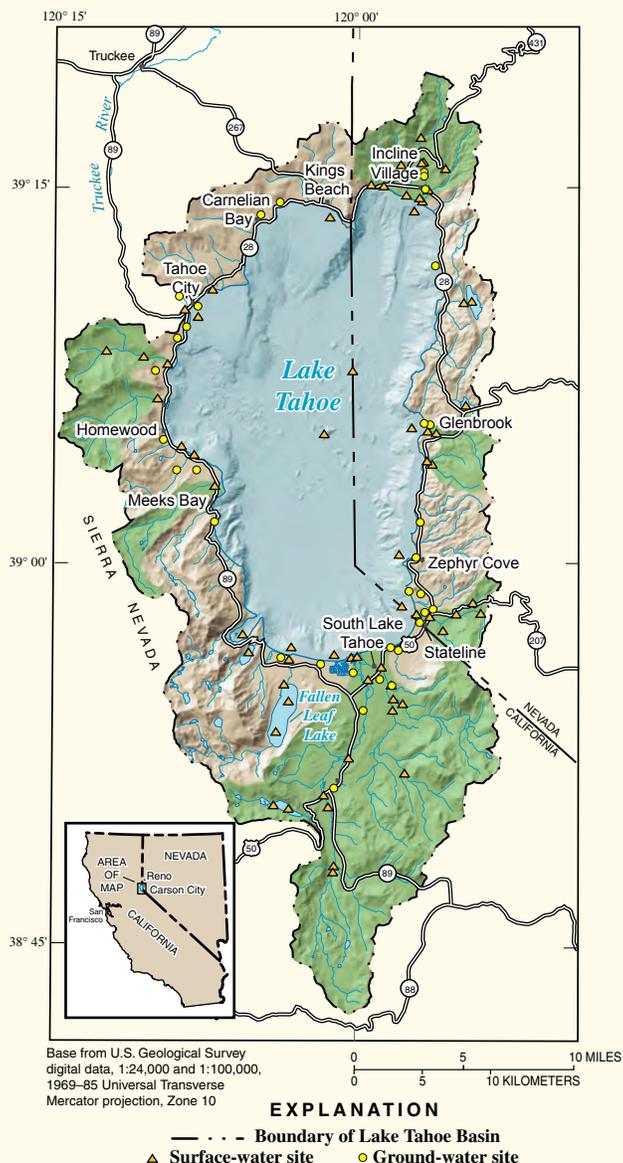
National Map—Lake Tahoe Pilot Project: Provides public access to high-quality geospatial data and information and integrates with TRPA's Tahoe Integrated Information Management System (TIIMS). <http://nationalmap.gov/projects/tahoe.html> or <http://www.tiims.org>

Lake Tahoe Data Clearinghouse: Designed to provide quick and easy access to geospatial data and information. <http://tahoe.usgs.gov>

Tahoe Environmental Geographic Information Systems: Developed numerous GIS coverages for TRPA from 1992 to 1995. <http://pubs.er.usgs.gov/pubs/wri/wri934182>

Lake Tahoe Bathymetry: Bathymetry of Lake Tahoe was remapped in 1997; shallow regions were mapped in 2000. The two data-sets have been merged to show the complete bathymetry. <http://walrus.wr.usgs.gov/pacmaps/lt-index.html>

Geologic Mapping: A fully attributed spatial database covering most of the basin has been completed at a scale of 1:24,000. Large-scale geologic information was compiled into a spatial database.



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Additional USGS Websites:

Activities in Nevada: <http://nevada.usgs.gov>
Geology Discipline: <http://geology.usgs.gov>
Geography Discipline: <http://geography.usgs.gov>
California Water Science Center: <http://ca.water.usgs.gov>

USGS Publications:

National: <http://pubs.usgs.gov>
Nevada: <http://nevada.usgs.gov/biblio/bibsearch.html>
California: <http://ca.water.usgs.gov/archive/reports/>